Space Weather Forecast

Issued on Wednesday 8 January 2025 at 12:54 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one long-duration Moderate-class flare observed peaking at 07/2305 UTC, likely from a sunspot region from just over the southwest limb. There are eight regions currently visible on the Earth-facing disc, with only one notable region approaching the north-centre disc. This remains moderately sized with a complex magnetic structure, although flare activity in the last 24 hours has significantly waned from previous days. A small and magnetically simple region in the southeast disc was responsible for C-class flare. The other regions across the disc are all small and simple, and either stable or showing signs of decay.

No Earth-directed coronal mass ejection (CMEs) were observed.

Solar Wind / Geomagnetic Activity: Solar wind speeds were initially elevated at 560-590km/s due to the glancing CME but quickly began to trend down, with speeds near 450km/s by the end of the period. The Interplanetary Magnetic Field, remained weak and steady throughout. The north-south component, was weak and variable, but slightly favoured a southward direction from 07/1250 UTC. Geomagnetic activity was initially Quiet to Unsettled (Kp 2-3) with an Active (Kp4) interval between 08/0000-0300 UTC, then falling to Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was near background, and well below the level of a minor Solar Radiation Storm (S1).

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate is expected with an ongoing chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CME's. Current slightly elevated solar winds are expected to continue erratically easing through Days 1-2 (08-09 Jan) to near background levels, before a further brief enhancement is likely from the fast winds from another much smaller and likely weaker coronal hole, on Days 3-4 (10-11 Jan). Geomagnetic activity is expected to be mostly Quiet with isolated Unsettled intervals. There is a chance of this increasing to Unsettled to Active with a slight chance of G1/Minor Storm intervals with the fast wind onset.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at or near background, with only a slight chance of rising in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	1	1	5	5
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	50	50	50	50
Very Active	**R3-R5 (X Class)**	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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